year of the experiments. Some rows, treated each year previously, were left untreated in the final year. Inadequate weed control, particularly of *Setaria verticillata* and *Digitaria sanguinalis*, then resulted.

The repeated use of atrazine in maize, grown on an alluvial loam, was also investigated. Atrazine was applied at 3.0 lb a.i. per acre (3.4 kg per hectare) to the same plots for three consecutive maize crops. Oats were grown in a field bioassay after harvest of the maize each year. No damage to the oats occurred in any year and maize yields were unaffected.

There was a change in the weed flora from a mixed grass and broadleaf situation to a predominantly grass one during the period between maize crops, indicating that the small amount of residue remaining after the maize harvest may have been sufficient for broadleaf but not grass control.

PICLORAM PERSISTENCE AND ITS EFFECT ON WHEAT CROPS

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Persistence of herbicides is often a useful property, but it can also limit a product's widespread usage. This is particularly so with picloram in cereal areas when it is used for perennial weed control and where soil residues may affect subsequent cereal crops.

A number of trials have been carried out to assess picloram's persistence in relation to sowing cereal crops at intervals after spraying. An area of Wimmera ryegrass-subterranean clover pasture free of any major perennial weed species was chosen. Picloram (as Tordon 50-D) was boom-sprayed in 40 gal. per acre of water (449.2 litre per hectare) at the following rates:

(1) Unsprayed control
(2) 2 oz a.i. per acre (0.15 kg per hectare)
(3) 4 oz a.i. per acre (0.3 kg per hectare)
(4) 8 oz a.i. per acre (0.6 kg per hectare)
(5) 16 oz a.i. per acre (1.2 kg per hectare).

Sprayings were made at approximately 4-monthly intervals and the wheat crop was sown at the usual time for the district. The yields are presented in Table 1.

From the Table it can be seen that significant yield reductions occurred at Numurkah with 16 oz applied up to 8 months before

sowing with 8 oz applied up to 4 months, and with 4 oz applied 1 month prior to sowing. However, at Rutherglen, only the 8 oz and 16 oz applied 1 month before sowing significantly reduced yield.

TABLE 1

Yields of Wheat in Bushels per acre

Months between spraying and sowing	Numurkah 1966 Rate of picloram (oz a.i. per acre)					Rutherglen 1969 Rate of picloram (oz a.i. per acre)				
	0	2	4	8	16	0	2	4	8	16
0-1	23.6	21.1	16.4	9.9	2.4	29.8	28.1	21.3	13.7	8.7
3-4	25.1	25.0	21.6	16.4	12.2	26.6	25.2	25.4	21.7	20.6
8-9	27.9	25.4	22.6	22.5	18.0	30.8	26.3	32.0	27.0	21.1
11-12	23.6	20.1	24.4	26.7	21.6	28.6	18.4	28.2	30.0	27.4
LSD - 0.05	5.5					10.8				

The most important factors in determining the persistence of picloram and its effect upon wheat yields are soil type and the rainfall between spraying and sowing. Examination of rainfall data from recording stations within 2 miles of each site show that rainfall at Rutherglen was greater than at Numurkah. This was consistent with higher yields at Rutherglen.

If yields from plots at both sites sprayed at 16 oz per acre are ranked in descending order, the rainfall between spraying and sowing shows a positive correlation with yield, i.e. the greater the rainfall between spraying and sowing, the greater the yield.

These results show that perennial weed control using 8 oz picloram per acre could have been carried out up to 8 months before sowing without damaging the following wheat crop. In this period over 10 in. of rain fell. (These results should not be extended to areas other than those in the trials, as the influence of soil type has not been determined).

If there is a high expectancy that rainfall between spraying and sowing will be at least 10 in. then spraying could be carried out even closer to sowing than 8 months.